CLAIMS

What is Claimed is:

1. A method of defining a first satellite communications system to mitigate communications interference with a second satellite communications system, the method comprising the steps of:

identifying a plurality of interference scenarios;

categorizing an interference requirement specifying a maximum interfering signal statistic at each of the second satellites according to a frequency of occurrence;

identifying at least one interference mitigation strategy for each scenario and each category of interference requirement;

determining the effectiveness of each identified interference mitigation means in mitigating interference for each of the scenarios and categories of interference requirement; and

selecting at least one of the identified interference mitigation means for the first satellite communications system according to the determined effectiveness of the interference mitigation means.

2. The method of claim 1, wherein the interference requirement is categorized according to a frequency of occurrence and intensity of an interfering signal from the first satellite communications system at the second satellite communications system.

3. The method of claim 1, wherein the first satellite communications system comprises at least one first ground station having a first ground station antenna characterized by a first ground station antenna main beam and at least one first ground station antenna side lobe and a plurality of first satellites having a first satellite antenna characterized by a first satellite antenna main-beam and at least one first satellite antenna side lobe, and the second satellite communication system comprises at least one second ground station having a second ground station antenna characterized by a second ground station antenna main beam and at least one second ground station antenna side lobe and a plurality of second satellites having a second satellite antenna characterized by a second satellite antenna main beam and a second satellite antenna side lobe, and wherein the plurality of interference scenarios comprises:

a first scenario wherein the second ground station antenna main beam interferes with the first satellite antenna main beam;

a second scenario wherein the first satellite antenna main beam interferes with the second ground station antenna main beam;

a third scenario wherein the second satellite main beam interferes with the first ground station antenna main beam; and

a fourth scenario wherein the first ground station antenna main beam interferes with the second satellite antenna main beam.

4. The method of claim 3, wherein the plurality of interference scenarios further comprises:

a fifth scenario wherein the second ground station antenna main beam interferes with the first satellite antenna main beam;

a sixth scenario wherein the first satellite antenna side lobe interferes with the second ground station antenna main beam;

a seventh scenario wherein the second satellite antenna side lobe interferes with the first ground station antenna main beam; and

an eighth scenario wherein the first ground station antenna main beam interferes with the second satellite antenna side lobe.

5. The method of claim 3, wherein the plurality of interference scenarios further comprises:

a ninth scenario wherein the second ground antenna side lobe interferes with the first satellite antenna main beam;

a tenth scenario wherein the second ground antenna main beam interferes with the first ground station side lobe;

an eleventh scenario wherein the first satellite main beam interferes with the second ground station side lobe; and

a twelfth scenario wherein the first ground station side lobe interferes with the second satellite antenna main beam.

6. A method of defining a first satellite communications system to mitigate communications interference with a second satellite communications system, wherein the first satellite communications system comprises a first ground station and a plurality of first satellites in a sub-geosynchronous orbit, each first satellite having an antenna including an off-axis sensitivity characteristic, and the second satellite communications system comprises a second ground station and a plurality of second satellites, the method comprising the steps of:

defining a short term interference requirement and a long term interference requirement from an interference requirement specifying a maximum communications interference between a first satellite communications system and a second satellite communications system;

selecting the off-axis sensitivity characteristic according to the short term interference requirement; and

selecting an antenna tracking rule according to the long term interference requirement, wherein the antenna tracking rule describes when each of the first satellites is permitted to communicate with the first ground station.

7. A system for providing broadband access to a communication service to user terminals, comprising:

a network of satellites, each satellite having:

at least one communication antenna for generating at least one beam cluster including a plurality of proximally disposed steerable communication beams;

a flexible channelizer for dynamically directing the steerable communication beams according to user terminal communication service demands; and

a plurality of gateway nodes, each gateway node associated with the user terminals serviced by the beam cluster, each gateway node for forwarding messages received from at least one of the user terminals serviced by the beam cluster via the network of satellites to the communication service, and for forwarding messages received from the communication service to at least one of the user terminals serviced by the beam cluster via the network of satellites.